

A good supply of water; pipes of good form and material, properly laid; and fair usage, are necessary to insure success. As to the pipes now manufactured, complaints are made that they have not advanced in quality; on the contrary, it would seem that the increased demand has led to slovenliness and overhaste. The manufacturers should look to this in time, or they may be superseded.

Mr. Grant, another of the surveyors, says, on this point:—

"Within the last few weeks I sent to know how the 4-inch drains I had put in at Exeter, twelve or eighteen months ago, had answered, and in every case I found that they had done so perfectly, notwithstanding that some of them had been put down without water supply. The parties concerned are perfectly satisfied with them.

What is the largest number of houses in one block that you have drained on the tubular system?—130 for one gentleman, but it was not convenient for him at the time to lay on water. The drains have, however, acted well, notwithstanding the risk thereby incurred."

When asked if the drain-pipes now manufactured are not very imperfect, he said, —

"They are, both in form and finish. A great many of the quality called "seconds," as well as of common red clay pipes, are used by private bricklayers, when they can escape supervision.

Do not the potters continue to make right-angled junctions, and other improper forms of pipes?—Yes; because the importance of better forms is not generally understood, and a trifling saving of 9d. per pipe is made by using a straight in connection with a right-angled pipe, instead of a curved with an acute-angled junction.

Will a 4-inch tubular drain take off the water falling upon the roof and yard, as well as that coming from the interior of a house of the largest class?—It will, if properly laid at an inclination of not less than 1 in 120.

What number of four-inch class houses may be drained by a 4-inch drain?—This will vary with the inclination and the extent of ground attached. In 1848 I drained five houses through such a pipe, and it has answered ever since perfectly and without any stoppage. Since then I have laid out the drainage of several blocks of eight, ten, and twelve houses, through 4-inch pipes, where the inclination was good; that is to say, 1 in 30 to 1 in 60."

Mr. Cress, Jun., an assistant-surveyor in the Sewers' Office, was asked as to the competition *Plans for the Drainage of London*, sent in to the previous Commission:—

"You were instructed by the Commissioners to examine and classify the plans for the drainage of the metropolis: did any of them make back-drainage a main feature of their project?—So far as I at present remember, none of them: some may have introduced the subject incidentally in their memorials, but had it constituted a main element in their plans, I should have retained a distinct recollection of it, having been anxious in examining them carefully to select any striking point as a characteristic of the individual scheme.

Did the competitors appear to deviate from the old practice of draining down the centres of the streets?—I think none of them; certainly the great mass of the plans was entirely upon the old system.

Did these schemes appear to evince a knowledge of the effects of concentrated house-drainage in reducing the size of main lines and the superfluous dimensions of the present sewers?—So far as the internal evidence of the plans themselves goes, to which alone I am enabled to speak, I can safely say that they did not. Of course it is distinctly understood that I speak solely of the plans, and am not in any way pronouncing upon the information possessed by the authors on these points.

Did you find any extensive advance upon the system which has hitherto regulated the metropolitan drainage?—No. Of course the proposals of many were on a much larger scale than anything hitherto done, but I think I may safely say that no principle remarkable for its novelty in an engineering point of view is to be found among them. I do not mean

that neither ingenuity nor merit is to be found there, but that no new scientific principle is advanced by them, nor any novel practical application of an existing principle; hence I cannot say that any advance upon existing systems has been made, or rather there being at present nothing deserving the name of a system, that a scientific basis for one has been created by the competition."

We shall return to these reports next week.

#### THE EFFECT ON ARCHITECTURE OF THE BUILDING FOR THE GREAT EXHIBITION.

ALTHOUGH the Great Exhibition of 1851 is an object of intense interest as well as hopefulness to the great hulk of the inhabitants, not only of this country, but of all the civilized nations of the world, there is a large class of philosophers of the "nil admirari" school whom one meets with every where, who go about asking *qui bono?* and prophesying nothing but evil and disappointment from this great industrial concourse of nations, and utterly unable to discover what good can arise to any one or to any art from such a monster exhibition.

It is not easy to meet such reasonings except by a counter prophecy, *ex quoque* kind of argument, that leads to nothing, and the answer may safely be left to the result. In the mean while, however, it will be well to point out satisfactory results as they arise, and gather in our harvest of lessons as they ripen. My own impression is, that a result has already been obtained so striking and so important that, were no other to arise, I, for one, would think that all the trouble and expense already incurred had been well bestowed. I should rejoice that the exhibition had been projected, though the experiment terminated to-day, and went no further than it has gone, for I feel certain that the art of architecture—certainly not one of the least important—has received a lesson from it which must sooner or later be felt in every branch of it, and will create a new and, I trust, a brilliant era for that hitherto misunderstood and misused art.

To make my meaning clear, it will be necessary to go back a little, and also to state the argument rather more egotistically than is quite pleasant—but let that pass. I have all my life been trying to find out and elaborate the true principles of architectural design, and for the last few years have done little else than try to expound, both orally and by writing of various shapes and sizes, what I conceive to be the only principles on which success in the art has ever been attained, or is now possible, which is simply, in a few words as I can express it,—"Aggregation of experience, under the guidance of common sense, for all essentials, with the addition of a moderate amount of good taste for the ornamental parts." Following out these principles, there is no nation in the world, however low it may have been in the scale of civilization, that has not been able to achieve success in this art. We alone in modern Europe have chosen to substitute a principle of copying instead, and as a necessary corollary, we alone have failed to do any thing satisfactory.

While I was trying to elaborate these principles theoretically by examining the works of all nations in their various climes, Mr. Paxton, guided only by his own native sagacity, was practically carrying them into effect; and, following them out literally, has arrived at the splendid result we now see daily growing, as if by magic, under our eyes. Indeed, so completely has he put into practice my theory—he, of course, being ignorant of it at the time—that I would ask for no better appendix to my "True Principles of Beauty in Art," than the lecture he delivered at the Adelphi on the 13th of November last. In it he enumerates, if not in the identical words which I had used before, at least in substance, every step I had pointed out as necessary to success; and showed how such a process had led him, as it must inevitably lead every one, in every art, to as satisfactory a conclusion. He told his admiring audience how, when he had built his first greenhouse, he set himself to find out its faults, and see how it could be improved: how his next was in consequence an improvement on the first—his third on the second, and so on. As

materials improved, he adopted them: any new process that was invented he greedily seized upon, combining all by his own sagacity, never looking back, but steadily progressing forward. He explained how, at last, it only required a few hours' thought to enable him to elaborate the whole design of the great exhibition house.

Following the same path, the Greeks were enabled, after aggregating the experience of some centuries, to build the Parthenon; and the same process enabled our Gothic forefathers to build the cathedrals of Rheims and Cologne; and, were we content to walk steadily in the same way, a century hence our children would be content to see, without remorse, the Parthenon burnt for lime, and Cologne cathedral used as a stone quarry,—simply, because they could do so much better that they could easily afford to despise such erections as these.

Let us now turn, for a moment, from the horticultural to the architectural side of the question.

When the commissioners for the great building were appointed, they advertised for designs: 240 were sent in, not only by English, Scotch, and Irish architects; but French, German, Italian—men of all nations entered the lists. Those who saw the designs, when exhibited in the rooms of the Institute of Civil Engineers, will admit that not one of them was equal to the occasion, and that the commissioners were perfectly justified in rejecting them all.\* There were, as their report expresses it, "the Egyptian hypostyle, the Roman thermal, the Arabian or Saracenic inscription," and, they might have added, the Gothic cathedrals,—every form of copying, and every thing but what was wanted.

The next task, then, was for them to select from these rejected plans such suggestions as could be gleaned, and to make a perfect design for the purpose wanted. As occurs to all architects when they attempt to make a design for a large interior, the first thing that presented itself to the minds of the commissioners was the dome of the Pantheon, which, accordingly, was to be adopted, but the engineer suggested that with iron, and modern appliances, a far larger one could be erected; so one 200 feet in diameter was determined on as the principal feature. The next building that suggests itself to all architects from Michaelangelo downwards, is the Temple of Peace: this was rather too solid for present purposes, but the other thermal of Rome presented modifications which were feasible; so immense arches enclosing smaller openings formed the ends, and long rows of aqueductal arches made up the sides. With all this array of ancient authority, and the prestige of best names of the profession, the design was published, but the public did not approve: people were this time in earnest, and it was not this they wanted. They felt this, but seeing what pains had been taken, and by whom the design was prepared, they were forced to admit that the problem was insoluble, and that that could be done was to try and stop the Exhibition altogether. At this juncture Mr. Paxton appeared on the scene,—either profoundly ignorant of or profoundly despising Vitruvius and his disciples,—had confidence in his faith in the 19th century, and was strong in his own common sense. For the first time in modern times it was a fair fight between the two antagonistic principles. The public, however, were now fairly roused, and unhesitatingly declared for common sense. The Exhibition was saved, and we have got a building of which every one approves.

Supposing the same principles had been carried into effect in the design for the Parliament Houses, the result would have been that the nation would have saved a million of money, and got a far more beautiful building than the House of Industry, because built of more solid and durable material, and its variety of purposes would have saved it from the monotony of the latter building. Had common sense guided the designers of the British Museum, half a million of the money wasted on that building might have been spent on the collection, and the whole been far better lodged in a more beautiful building than the present. Had the same principles guided the Com-

\* We must guard ourselves from being supposed as so servidly to admit this.—Ed.